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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/765,830 | 01/29/2004 | Atsushi Fukuda | 248225US8 | 2363 |
| 22850 | 7590 | 05/03/2006 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | LE, LANA N | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2618 | |

DATE MAILED: 05/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/765,830

Applicant(s)

FUKUDA ET AL.

Examiner

Lana N. Le

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-10 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: line 3, before "interference", add ---an----. Appropriate correction is required.
2. Claim 7 is objected to because of the following informalities: line 3, after "for", "adjust" should be "adjusting". Appropriate correction is required.
3. Claim 9 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim 3 or 8. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito (US 4,989,262).

Regarding claim 1, Saito discloses a radio communication terminal (fig. 1) comprising:

a receiver (2) connected to a receiving antenna (1), and interference canceller (10-1) for canceling a radiated noise component of electronic equipment from a received signal output from said receiver (col 2, lines 51-68); wherein said interference canceller (10-1) includes:

a radiated noise predictor (6-1, 7-1, 8-1, 9-1) for generating a pseudo interference signal based on the radiated noise produced by said electronic equipment; and an adder (11) for adding together said received signal (from main IF converter 2) and said pseudo interference signal (from 6-1) to cancel said radiated noise component in said received signal (col 3, lines 14-19).

Regarding claim 2, Saito discloses the radio communication terminal of claim 1, wherein said interference canceller is provided with means (3-1) for obtaining radiated noise from said electronic equipment (external interference source 30-1) and generates said pseudo interference signal from said radiated noise based on the output (feedback from adder 11 to 13, 15, 17, 8-1) from said adder (11) (col 3, lines 29-54).

Regarding claim 7, Saito discloses the radio communication terminal of claim 1, which further comprises a second receiver connected to a second antenna (3-1), and wherein said radiated noise predictor includes: an amplitude/phase adjustor (6-1) for adjust the amplitude and phase of a received signal from said second receiver to generate said pseudo interference signal; and a control part for controlling the amplitude and phase adjustments by said amplitude/phase adjustor based on the output from said adder so that said pseudo interference signal and the output from said first receiver cancel each other during the transmission interruption period of the transmitting side.

Regarding claim 8, Saito discloses the radio communication terminal of claim 1, which further comprises a plurality of receivers (2, receivers to receive signal from transmitter station; col 3, lines 20-22) each connected to one of a plurality of antennas (1, 3-1,...,3-n), a diversity receiver (12) and wherein: said interference canceller (10-1) includes a plurality of adders (11-1,11-2,... 11-n) each corresponding to one of said plurality of receivers; said radiated noise predictor includes a plurality of amplitude/phase adjustors (6-1) for adjusting amplitudes and phases of radiated noises from electronic equipment (30-1) to generate pseudo interference signals in correspondence with said plurality of receivers, and a control part (8-1, 9-1) for controlling the amplitude and phase adjustments by said plurality of amplitude/phase adjustors based on the outputs from said plurality of adders (feedback from outputs of adders 11-1,.....11-n), the outputs from said plurality of adders being diversity-received by said diversity receiver (12).

Regarding claim 9, Saito discloses the radio communication terminal of claim 3 or 8, wherein said interference canceller (10-1; fig. 1) includes a band converting part (5-1) which converts said radiated noise from electronic equipment (10-1) to the same band as that of the output received signal of said receiver (2) and provides the converted output to the radiated noise predictor (6-1, 7-1, 8-1, 9-1).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4,989,262).

Regarding claim 3, Saito discloses the radio communication terminal of claim 1, wherein said radiated noise predictor includes:

an inherent amplifier (within 6-1) connected to said electronic equipment, for controlling the level of the radiated noise obtained therefrom;

a phase shifter (6-1) for controlling the phase of said radiated noise; and a control part (8-1, 9-1) for controlling the gain of said amplifier and the phase-shift amount of said phase shifter (5-1) based on the output from said adder (feedback from 17, to 8-1, to 6-1) (col 3, lines 29-54). Saito does not disclose the amplifier and shifter are connected in series. However, the examiner takes official notice that a separation of the amplifier and the phase shifter from the integrated amp. and phase controller block is well known and notoriously old in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a phase shifter in series with amplifier in order to control the level and control the phase in order or one at a time instead of simultaneously.

8. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4,989,262) in view of Terai et al (JP 04,047,705).

Regarding claim 4, Saito discloses the radio communication terminal of claim 1, wherein Saito does not disclose said radiated noise predictor includes: an adaptive filter for generating said pseudo interference signal by adaptively filtering said radiated noise; and a control part for controlling coefficients of said adaptive filter based on the output from said adder. Terai et al disclose a radiated noise canceling system including an adaptive filter (7) for generating said pseudo interference signal (noise canceling signal) by adaptively filtering said radiated noise (see purpose); and a control part (6) for controlling coefficients of said adaptive filter (3) based on the output from said adder (8) (see constitution; fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an adaptive filter and a control part in order to have the adaptive filter filter out the noise component and control the coefficients based on the result of adder so that the filter is adjusted optimally.

Regarding claim 5, Saito discloses the radio communication terminal of claim 1, wherein Saito does not disclose which further comprises a memory for storing a radiated noise component received by said receiver during a transmission interruption period of a transmitting side, and wherein said radiated noise predictor includes an adaptive filter for generating said pseudo interference signal by adaptively filtering the radiated noise component read out from said memory during the transmission interruption period or transmission period of the transmitting side; and a control part for controlling coefficients of said adaptive filter based on the output from said adder. Terai

et al disclose a memory (coefficient memory) for storing a radiated noise component received by said receiver (9) during a transmission interruption period of a transmitting side, and wherein said radiated noise predictor includes an adaptive filter (7) for generating said pseudo interference signal by adaptively filtering the radiated noise component read out from said memory (coefficient memory) during the transmission interruption period or transmission period of the transmitting side; and a control part (6) for controlling coefficients of said adaptive filter (7) based on the output from said adder (8) (see constitution; fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have an adaptive filter, a memory, a control part in order to store the noise detected and have the adaptive filter out the noise signal and control the coefficients based on the result of adder so that the filter is adjusted optimally as suggested by Terai et al.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4,989,262) in view of Mitsuo (JP 05-160,762).

Regarding claim 10, Saito discloses the radio communication terminal of claim 1, which further comprises a second receiver connected to a second receiving antenna (3-2), Saito does not disclose wherein said radiated noise predictor includes: first for multiplying received signals from said first and second receivers by first and second tap coefficients, respectively, and for providing the multiplied outputs to said adder; and a control part for controlling said first and second tap coefficients based on the output from said adder so that radio noise components in the outputs from said first and second multipliers cancel each other. Mitsuo discloses first and second multipliers

(Msub0 - MsubN) for multiplying received signals from said first and second receivers by first and second tap coefficients (tap coefficients outputted from 7), respectively, and for providing the multiplied outputs to said adder; and a control part (7) for controlling said first and second tap coefficients based on the output from an adder (feedback from 9, 10) so that radio noise components in the outputs from said first and second multipliers cancel each other (fig. 1; paras. 28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to multiply with tap coefficients in order to control the coefficient accordingly in order to cancel out the echo or noise signal as suggested by Mitsuo.

Allowable Subject Matter

10. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 6, Saito disclose the radio communication terminal of claim 1, wherein Terai et al disclose the terminal having a subtractor (8) for subtracting the selected output of said selector from the output of said receiver; an adaptive filter (7) for generating said pseudo interference signal by adaptively filtering the output from said subtractor by filter coefficients; and a control part (6) for controlling the coefficients of said adaptive filter based on the output from said adder (8).

However, Saito, Terai, and the cited prior art fail to disclose the terminal comprises a training signal generating part for generating a training signal, and wherein said radiated noise predictor includes: a selector for selecting the training signal from said training signal generating part during a period of transmission of a training signal from the transmitting side and for selecting the output from said adder during a period of receiving an information signal from the transmitting side.

Conclusion

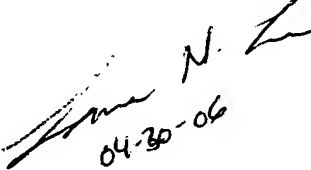
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2618

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le


04-30-06
LANA LE
PRIMARY EXAMINER